

REMARKS

This is a response to the Office Action dated September 13, 2004. Claims 1-29 are pending in the present application. Individual issues raised by the Examiner will be addressed next in order in which they appear in the Office Action.

Objection to the Specification

In paragraph 1 of the Office Action, the title of the application was objected as being non-descriptive. Applicants have amended the title as requested by the Examiner, and ask that the new title be made of record and used in subsequent correspondence regarding this application.

Claim Rejections under 35 U.S.C. § 102

In paragraphs 2-20 of the Office Action, claims 1-29 of the application were rejected as being anticipated by U.S. Patent No. 5,280,243 to Miller. Applicants respectfully traverse.

The Miller patent discloses an NMR downhole logging apparatus comprising, inter alia, a flexible tubular permanent magnet (46) for generating static magnetic field, an antenna (48) for exciting nuclei of the underground materials and for receiving nuclear magnetic resonance signals, and a drill collar (38) having a plurality of fins (40) projecting radially outward for stabilizing the logging apparatus in the bore hole during drilling/logging. (*See*, for example, Miller patent at col. 3, ll. 20-35; col. 5, ll. 27-28, 35-38, 54-59; col. 6, 30-44; col. 7, ll. 12-52; Figs. 1, 2 and 4). Notably, the Miller patent is discussed as prior art in the present application (*see*, for example, paragraphs 8-10, and Figures 1-3 of the present application).

The Office Action is based on the assertion that Miller discloses a magnet “twisted about the longitudinal axis to form a helical spatial configuration and to generate a helical static magnetic field substantially perpendicular to the longitudinal axis,” and “an antenna configured to generate a radio frequency (RF) magnetic field substantially perpendicular to the static magnetic field of the magnet and having a helical configuration substantially similar to the spatial configuration of the magnet.” The Examiner apparently relies on Figures 1, 2 and 4, and the description of permanent magnet 46 and antenna 48 in support of the assertion (*see* paragraph 3 of the Office Action). Applicants respectfully disagree for the following reasons.

Specifically, Miller discloses that a permanent magnet 46 comprises a tubular member, which serves to create the static magnetic field in the sensitive volume. (*See* Miller

at col. 5, ll. 54-57). More particularly, Miller describes magnet 46 as comprising “a thin walled cylindrical tube or sleeve which is formed of a non-conductive, permanent magnetic ferrite material” (see Miller at col. 7, ll. 12-13). Miller’s magnet 46 has “a uniform magnetization axis, which is perpendicular to the longitudinal axis 28 of the apparatus 20.” (See Miller at col. 7, ll. 12-20).

Applicants have been unable to find in Miller any disclosure, teaching or even a suggestion that magnet 46 is twisted about its longitudinal axis to generate a helical static magnetic field. Furthermore, there is no suggestion in Miller to use an antenna “having a helical configuration substantially similar to the spatial configuration of the magnet,” as asserted in the Office Action. To the contrary, the antenna disclosed in the Miller patent “comprises two pairs of parallelly connected conductor pairs 52 and 54” (see col. 6, ll. 3-5), as illustrated best in Figure 4 of the Miller patent. The Miller disclosure, which is also reproduced in Figure 3 of the present application under the heading “Prior Art” clearly provides no teaching or even a suggestion that either the magnet or the antenna have helical configuration. In this regard, applicants also wish to point out that twisted fins (40) of drill collar (38) in the Miller patent are not part of magnet (46) and, as disclosed for example at col. 5, ll. 27-42 of the patent, are used solely for stabilizing the logging apparatus during drilling/logging, and not for the generation of a magnetic field.

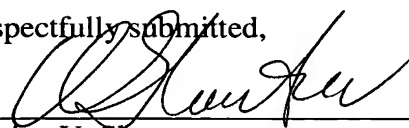
Accordingly, Applicants respectfully submit that claim rejections are based on an incorrect reading of the Miller reference, and therefore that claims 1 and 24, as well as all claims dependent thereon, are patentable over the prior art of record.

Applicants have attached hereto an Information Disclosure Statement filed under 37 C.F.R. § 1.97(c) and respectfully request the Examiner to consider the attached “List of References Cited By Applicant.”

Should the Examiner have any question regarding this submission, she is invited to call the undersigned at the number listed below.

Date: February 14, 2005

Respectfully submitted,


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